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ABSTRACT

Technology has a unique place in the elementary classroom. It provides an unparalleled vehicle for integrating many traditional subject areas. It serves to break down curricular barriers while at the same time promoting situated learning. This paper describes the implementation of a unit that focuses on the technology of the dike systems. Dikes have been used world wide to reclaim land from the ocean. This curriculum project is particularly relevant to students in the dikelands described herein, however, it serves as a model for choosing regional industry to develop technology-centered curriculum. Includes the worksheet reviewing information on Acadians and resource list. (Author)

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The Acadian Dikes: An Interdisciplinary Study of Technology

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Abstract

Technology has a unique place in the elementary classroom. It provides an unparalleled vehicle for integrating many traditional subject areas. It serves to break down curricular barriers while at the same time promoting situated learning.

This paper describes the implementation of a unit that focuses on the technology of the dike systems. Dikes have been used world-wide to reclaim land from the ocean. This curriculum project is particularly relevant to students in the dikelands described herein, however, it serves as a model for choosing regional industry to develop technology-centred curriculum.

The Acadian Dikes: An Interdisciplinary Study of Technology

Technology certainly permeates the society we live in today, but our history also contains rich examples of technology as "a way of adapting". The project described here is one example of the unique way in which technology can serve as a centrepiece, drawing together all subject areas into an interdisciplinary unit.

The Acadian culture was the subject of the student study in this grade five classroom. Acadians, originally hailing from France, were a particularly industrious group of people who, through their use of technology, were able to prosper by reclaiming land from the ocean using a dike system. These dikes remain to this day in working order and are an icon of technology in the communities in which these students live. When communities bear record of past technologies it provides an authentic curriculum base for their students.

A Short History

The Acadians arrived from France in the early 17th century to establish a region they called l'Acadie (in Nova Scotia and New Brunswick, Canada). These people were predominantly farmers who tended to be characterised as "lazy" by the British because they chose to reclaim land using dikes rather than clear the upland forests. Applying their knowledge of dikes (passed onto the French from the Dutch) these people prospered in their farming communities. The focus of many historical accounts is the traumatic and forceful "Expulsion of 1755" in which approximately 6000 settlers were torn from their homes by the British and dispersed to Massachusetts, Connecticut, New York, Maryland, North and South Carolina, and Virginia. In 1785 a large community of these displaced

peoples settled and began to prosper in Louisiana where the rich Acadian culture lives on today.

The Interdisciplinary Study

This unit study was designed to consider the technology involved in the construction and operation of the dike system and the social study of the Acadian culture. Table 1 outlines an overview of the integrated curriculum.

Resources

Students were introduced to the topic through a discussion of the local artefacts of technology, namely the prevalent dike systems in their communities. Students had little knowledge of the history of the dikes. After a brainstorming activity on the probable artisans present in an 17th century Acadian community, each student was assigned an individual role (see Table 2). Students were then provided with a package of resource materials (Table 3) to use as a basis to respond to the research framework shown in the Appendix.

The Dike Model and Aboiteau

The model was prepared with the help of students using a half sheet of plywood as the base. On this was placed a cardboard framework which allowed for the construction of a waterway, a dike ridge, and a lowland pasture. The cardboard was then covered with paper mache and shaped to the product model using plaster of Paris. The model height was approximately 10-12 cms when completed. At the end facing the ocean, a 3 cm^2 hole was left to accommodate the water gate, commonly referred to as the "aboiteau".

Finally the model, shown in Figure 1, was appropriately painted complete with a roadway on the highland to situate the model community to be added later in the exercise.

The aboiteau shown in Figure 2 was built in advance by the instructor from 1/8 in. plywood, Popsicle sticks and carpenters glue using the dimensions indicated. Note that the floor of the gate is elevated at one end such that the gate swings in one direction only.

Character Sketch and Role Play

This grade five class was asked to write a short story, "a day in the life of ..." their character. These stories were written in first person narrative from a variety of perspectives and reflected their on-going research into community life as an Acadian. The stories formed the basis for a presentation in class in which students played out the roles of their individual characters as they saw themselves preparing to construct a dike.

Discussion of the Technology

The technology of dike building was discussed with the class at length. The following ideas were highlighted.

The construction of the dikes always began during the season of the neap tides. At this time of the year the tides tended to be lower on average due to the lack of alignment of the moon and sun. The subject of science of the tides and their regular six-hour cycle was a natural extension of this discussion.

A crew of eight dikebuilders would find a firm marsh with ready access to black grass sods. These sods had wiry roots and would bond and mesh well with the marsh mud. The first step was to cut a long narrow trench called a key down the middle of the future dike path. Then 10 cm bricks of sod were cut with a 30-degree angle on the grass side. These "permangues" were then packed on either side of the key and marsh mud

added in between to fill the key. After solid packing by foot the next layer of sods was added. It was crucial that the key was cut and packed carefully as this helped to prevent the dike from sliding during a high tide. In some cases brush and stakes were added to face the dike wall to prevent erosion. The work of the dike builders was carefully co-ordinated. Digging, sod removal and placement, and transfer of sods were aided by oxen.

A more difficult task was construction of the "aboiteaux". The aboiteau is a one-way water gate that restricts flow coming from the ocean and permits drainage from the marsh out to the ocean. After the Acadians had prepared dikes along the banks of the tidal creek only a small channel of water remained. This flow had to be halted entirely such that the next high tide didn't destroy all the work accomplished. For this reason it was necessary to work quickly between tides. This problem was solved by doing the job in two steps. First, a small aboiteau was easily built far upstream where the creek was narrow. This helped to reduce the volume of water flow and give the workers time to construct a larger aboiteau further downstream. The first step in preparing the aboiteau was to find a firm clay foundation in the creek bed. For the sluice, a large log was cut to length and shaped into a trough using an adze, axe, hammer, and chisel. The sluice door was constructed of hardwood and hung from two horns acting as hinges. A roof was added to the waterway and the entire assembly covered level with sods and marsh mud.

The aboiteau allowed for the excessive rainfall to leach out the salt from the recovered marsh and drain it into the ocean. The dike prevented the ocean from returning over the marsh. After two to four years the dikelands were left as fertile soil. In the end the marshlands were much more productive than the cleared uplands. The Acadians became quite prosperous in the farming as a result of an indigenous marsh grass called

spartina. This they fed to their cattle through the winter while other settlers had to butcher their livestock each year.

The Acadians were exceptionally hardworking and resourceful people. Many stories and poems have been written about their lives the most famous of which is probably Evangeline by Henry Wadsworth Longfellow (Tallant, 1957; Brasseaux, 1988)

Completing the Model

The model Acadian village was completed by undertaking a design activity. Students were asked to research the likely dimensions of the structures common in an Acadian village. Using the elementary design program "TABS + ", a series of homes, churches and outbuildings were prepared. The unique feature of this program is that it creates flat prints of three-dimensional designs. These prints are generated with tabs such that they can be folded and glued to construct the three dimensional model. The conclusion of the unit saw students hot gluing their structures together and decorating them with textured roofs and siding to simulate available materials of the time. The farmyards were then adorned with fences and various tools and structures thought to be common in the Acadian village.

Conclusion

The elementary classroom is an ideal setting to promote cross-disciplinary projects. Technology remains one of the single best core areas to draw together science, language arts, mathematics, and social studies. Inherent in the study of any technology is the importance of historical context. In this example there is an added benefit of an authentic activity when the history relates to a community in which the children live. Activities that build on the history of technology in regional communities will seem

much more relevant to their students. Our students now see that the impact of technology on the Acadians was clearly a decided factor in their early prosperity in the New World.

References

Brasseaux, C. A. (1988). In search of Evangeline: Birth and evolution of the Evangeline myth. Thibodaux, LA: Blue Heron Press.

Tabs + V 1.30 (Computer Software). (1997). Aspex Software.

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Appendix

The Acadian Project

This worksheet is to help you learn more about the Acadians, and what your character's role in the community might have been. Use the resources provided to answer the following.

1. Answer the following questions about Acadian lifestyle during the 1700s.

   a) Where in Nova Scotia did the Acadians of the early 17th century (1630) settle?

   _____

   _____

   b) What did the Acadians use for trading?

   _____

   _____

   c) The Acadians are known for their great sense of community. Traditionally, what would happen when a young couple married?

   _____

   _____

   _____

   d) Where did the technology of the dikes come from?_____

   e) What did the dikes allow the French settlers to do?

   _____

   _____

   _____

   f) How did the British view the dike approach to agriculture?

   _____

   _____

   _____

   g) Draw a sketch of an aboiteau? What was the aboiteau made from?

h) Explain how the aboiteau technology allowed the dikes to be prepared for agriculture.

i) The Acadians must have been very resourceful and hardworking people. How did they manage to build the dikes while the ocean continued to generate high and low tides.

j) The Acadians were great problem-solvers when it came to the using technology. What did they do to prevent the dike wall from being washed away?

k) The salt-marsh hay allowed the Acadians to be self-sufficient. What were they able to do as a result of this crop?

l) Describe what an Acadian house may have looked like & what it might have been built with. Was there anything special about the buildings? Explain.

2. Answer the following questions from with *your* Acadian character in mind.

   a) What is your character's job? What duties does that include?

   b) How do you think your character participated/helped in community life?

   c) How do you think your character would have felt about their life & responsibilities?

   d) What might have been your character's role in making the dykes?

   e) What types of activities does your character enjoy, perhaps on special occasions or weekends?

   f) In your opinion, what would be the most important parts of your character's life?

g) In 1755, the Acadians were loaded onto boats by the British and taken away from their farms. This was called the "Expulsion of the Acadians". Imagine what it must have been like to leave your home and all of your belongings behind. How do you think you would have felt?

h) The Acadians were transported by boat to many places in the United States including Massachusetts and Virginia. Eventually some made their way to Louisiana and today we often hear about the Cajun culture there. How are the traditions of the Louisiana Cajuns similar?

i) The Acadians continue to be recognised as a very hard working people. With a little research you should be able to identified some of their more recent contributions to our society.

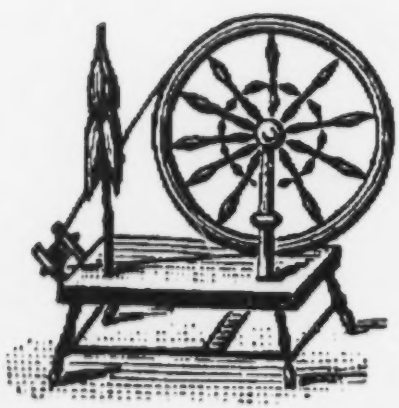

Table 1

Project Overview

Student Interaction With Acadian Resource Materials
Assignment of Characters
Construction of the Dike Model
Character Sketches
Role Play
Discussion of Technology
Completion of the Model

Table 2

Sample Roles

Farmers:	Pierre and Marie LeBlanc
Children:	Jacques, Helene and Renard
Farmers:	Louis and Claire Cormiers
Children:	Philippe, Eloise and Analise
Blacksmith:	Jean and Michelle Thibodeau
Children:	Joseph and Claude
Woodwork:	Simon and Francine Brossard
Clergy:	Charles Pellerin
General Merchandise:	Paul and Denise Suret

Table 3

Resources

Maritime Dykelands; A 350 Year Struggle, Nova Scotia Department of Agriculture, 1987.

Brief History of Acadie; 1604-1992,4th Edition, Rene Babineau, Andrepont Printing Inc. 1992.

Two Beginnings; A brief Acadian History, J. Alphonse Deveau, Lescarbot Press, 1980.

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The Acadians; Settlement, Nova Scotia Museum Document, Nova Scotia Department of Education, 1987.

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The Acadians; The Home, Nova Scotia Museum Document, Nova Scotia Department of Education, 1987.

Figure Captions

Figure 1. The completed model.

Figure 2. The aboiteau.

Figure 1.

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Figure 2.